

CLAIMS

What is claimed is:

- Sub
a1
- 5
1. A method for screening fabric handle of an array of fabric samples, comprising:
providing an array of at least two fabric samples;
protruding said fabric samples through openings; and
monitoring response of said fabric samples to said protrusions.
- 10
2. The method of Claim 1, wherein the method is capable of screening at least two of said fabric samples simultaneously.
3. The method of Claim 1, wherein the method is capable of screening at least twenty-four of said fabric samples simultaneously.
- 15
4. The method of Claim 1, wherein screening throughput rate of said array is no greater than about ten minutes.
- 20
5. The method of Claim 1, wherein average sample throughput is not more than about two minutes per said fabric sample.
6. The method of Claim 1, wherein average sample throughput is not more than about 20 seconds per said fabric sample.
- 25
7. The method of Claim 1, wherein said array contain at least two different fabric materials.
8. The method of Claim 1, wherein said fabric samples comprise of at least one material selected from the group consisting of woven materials, non-woven materials, knit materials, pile materials, blend materials, composite materials, and a combination thereof.
- 30
9. The method of Claim 1, wherein at least one of said fabric samples has been subject to textile treatment selected from the group

consisting of acrylic coating, airo finishing, bleaching, resin treatment, sanding, scenting, shearing, silver coating, wax coating, stonewashing, bonding, enzyme washing, flocking, glazing, mercerizing, milling, fulling, color treatment, texture treatment, bacterial resistant treatment, soil resistant treatment, oil repellent treatment, flame resistant treatment, pill resistant treatment, water resistant treatment, mildew resistant treatment, water repellent treatment, wrinkle resistant treatment, ultra violet resistant treatment, and a combination thereof.

10 10. The method of Claim 1, wherein at least one of said fabric samples has been treated with an additive selected from the group consisting of binders, surfactants, fillers, reinforcements, flame retardants, colorants, environmental protectants, performance modifiers, control agents, plasticizers, cosolvents, accelerators, and a combination thereof.

15 11. The method of Claim 1, wherein said protrusions are completed without piercing said fabric samples.

20 12. The method of Claim 1, wherein said openings are shaped in a fashion that allows said fabric samples to fold naturally providing a smooth transition for said fabric samples to transfer from a flat state to a bent and folded state during said protrusions, and allows contact to exist between said fabric samples and said openings' interior walls during said protrusions.

25 13. The method of Claim 1, wherein each of said openings is funnel-shaped having its top diameter that is about twice of its bottom diameter and its sloped section is about at least equal to height of its straight section.

30 14. The method of Claim 1, wherein said openings are each individually surrounded by an indentation that restricts said fabric samples' horizontal movement.

15. The method of Claim 1, wherein the diameter of said fabric samples is greater than about two times the diameter of said openings.

16. The method of Claim 1, wherein the diameter of each of said fabric samples is less than about eighteen millimeters but is greater than about eight millimeters

17. The method of Claim 1, wherein said protrusions causes said fabric samples to fold and are eventually and completely forced through said openings.

18. The method of Claim 1, wherein each of said protrusions is of a distance at least equal to the radius of said fabric samples.

19. The method of Claim 1, wherein said array of fabric samples are placed onto a sample holder having said openings and said fabric samples are individually confined in specific locations, each of said specific locations includes and extends beyond a region defined by diameter of said openings, and said fabric samples do not overlap each other.

20. The method of Claim 1, wherein said array of fabric samples are placed into a sample holder having a first plate having a plurality of through-holes and a second plate having a plurality of openings that are aligned forming tunnels within said sample holder wherein said fabric samples are individually confined in specific locations that are between said first plate and said second plate, and each of said specific locations includes and extends beyond a region defined by diameter of said openings.

21. The method of Claim 22, wherein a gap of at least about one millimeter gap exists between said first plate and said second plate.

Sub
A8

22. The method of Claim 1, further comprised of regulating environmental conditions of said fabric samples by an environmental chamber.

5 23. The method of Claim 1, wherein said translating said fabric samples in a direction normal to an end of at least one probe is conducted at a constant speed less than about ten millimeters per second but greater than about one millimeter per second.

10 24. The method of Claim 1, wherein said monitoring response of said fabric samples to said protrusions are performed by at least one sensor and a data logger for recording said response.

15 25. The method of Claim 1, further comprised of conducting an analysis selected from the group consisting of relative comparison of the fabric handle of said fabric samples, quantitative measurement of the fabric handle of said fabric samples, and comparison of the fabric handle of said fabric samples with the fabric handle of fabric materials not included in said array.

20 26. The method of Claim 1, wherein said protrusions are conducted by at least one probe.

25 27. The method of Claim 26, wherein monitoring said response of said fabric samples to said protrusions includes measuring said force exerted on said at least one probe by said fabric samples as functions of displacement between said at least one probe and said fabric samples.

30 28. The method of Claim 26, wherein monitoring said response of said fabric samples to said protrusions includes measuring said force exerted on said at least one probe by said fabric samples as functions of time.

29. The method of Claim 26, wherein said protrusions are caused by having said array placed in a movable sample holder translating in a direction normal to blunt end of said at least one probe.

5 30. The method of Claim 26, wherein said protrusions are caused by having blunt end of said at least one probe translating in a direction normal to said array.

31. The method of Claim 26, wherein said at least one probe is
10 comprised of a test fixture with a blunt end for protruding said fabric samples.

32. A method for screening fabric handle of an array of fabric samples, comprising:

placing an array of fabric samples having at least eight different fabric
15 samples into a sample holder having a first plate having a plurality of through-holes and a second plate having a plurality of openings that are aligned forming tunnels within said sample holder, and wherein said fabric samples do not overlap each other and are individually confined in specific locations that are between said first plate and said second plate, each of said specific
20 locations includes and extends beyond a region defined by diameter of said openings, said openings having a diameter ranging from about eight millimeters to eighteen millimeters, the diameter of said fabric samples is greater than about two times the diameter of said openings; and a gap of at least about one millimeter gap exists between said first plate and said second
25 plate;

protruding said fabric samples completely through said openings without piercing said fabric samples by translating said sample holder in a direction normal to the blunt end of at least one probe at a constant speed, wherein said openings are shaped in a fashion that allows said fabric samples
30 to fold naturally providing a smooth transition for said fabric samples to transfer from a flat state to a bent and folded state during said protrusions, and allows contact to exist between said fabric samples and said openings' interior walls during said protrusions;

monitoring responses of said fabric samples to said protrusions with at least one sensor and a data logger for recording said response which includes measuring said force exerted on said at least one probe by said fabric samples as functions of displacement between said at least one probe and
5 said fabric samples and measuring said force exerted on said at least one probe by said fabric samples as functions of time; and

conducting an analysis selected from the following group consisting of relative comparison of the fabric handle of said fabric samples, quantitative measurement of the fabric handle of said fabric samples; comparison of the
10 fabric handle of said fabric samples with the fabric handle of fabric materials not included in said array.

33. The method of Claim 32, wherein the method is capable of screening at least four of said fabric samples simultaneously.

15

34. A method for screening fabric handle of an array of fabric samples, comprising:

placing an array of fabric samples having at least two fabric samples onto a sample holder having a plurality of openings having a diameter ranging
20 from about eight millimeters to eighteen millimeters, and wherein said fabric samples do not overlap each other and are individually confined in specific locations that are aligned with said openings, each of said specific locations includes and extends beyond a region defined by diameter of said openings, and the diameter of said fabric samples is greater than about two times the
25 diameter of said openings;

protruding said fabric samples completely through said openings without piercing said fabric samples by translating blunt end of at least one probe in a direction normal to said array at a constant speed, wherein said openings are shaped in a fashion that allows said fabric samples to fold
30 naturally providing a smooth transition for said fabric samples to transfer from a flat state to a bent and folded state during said protrusions, and allows contact to exist between said fabric samples and said openings' interior walls during said protrusions; and

monitoring responses of said fabric samples to said protrusions with at least one sensor and a data logger for recording said response which includes measuring said force exerted on said at least one probe by said fabric samples as functions of displacement between said at least one probe and
5 said fabric samples and measuring said force exerted on said at least one probe by said fabric samples as functions of time; and

conducting an analysis selected from the following group consisting of relative comparison of the fabric handle of said fabric samples, quantitative measurement of the fabric handle of said fabric samples; comparison of the
10 fabric handle of said fabric samples with the fabric handle of fabric materials not included in said array.

35. The method of Claim 34, wherein average sample throughput is not more than about two minutes per said fabric sample.

15

FOR OFFICIAL USE ONLY